

Environmental Studies Program: Ongoing Studies

Study Area(s): Gulf of Mexico

Administered By: Gulf of Mexico

Title: A Critical Real-Time Louisiana Coastal Ocean Observing Station

BOEM Information Need(s) to be Addressed: : One of the major challenges facing in the northern Gulf of Mexico coastal area is the need of a better and reliable offshore met-ocean real time data collection system that supports the mission of the BOEM and other federal and local agencies for coastal management, protection, and restoration, especially along the Louisiana coast. This area has a suite of environmental problems that require the acquisition of real time data for immediate assessment or model based assessment and predictions that rely on this kind of data. This need was demonstrated during the Hurricanes Katrina, Rita, Gustav, and Ike as well as the 2008 and 2011 Mississippi River flood diversions, and 2010 Deepwater Horizon oil spill event. The WAVCIS station will take time-series optical measurements that will enhance the met-ocean data collection to support BOEM decision making related to environmental conditions and sediment transport in the study area. The optical measurements will also support efforts to improve ocean color satellite estimates of these environmental parameters in optically complex coastal waters and provide data support to the BOEM-funded project enhancing understanding and developing a conceptual geomorphic evolutionary model for mud-capped dredge pit evolution.

Total Cost: (in thousands) \$746 (BOEM/LSU Match) **Period of Performance:** FY 2016-2018

Conducting Organization(s): Louisiana State University, Department of Oceanography and Coastal Sciences

BOEM Contact(s): Jessica Mallindine, Jessica.mallindine@boem.gov

Description:

Background

The Coastal Studies Institute at LSU has been providing technical and operational services to one of the eleven regional associations of the US Integrated Ocean Observing System (IOOS) along the Louisiana coast, the GCOOS Gulf Coast Ocean Observing System (GCOOS). These services are made through the Wave-Current-Surge Information System established in 1997. They are well in line with the BOEM's mission as BOEM "must make decisions about the environmental risks and socioeconomic impacts of offshore oil and gas development in federal waters", which all require reliable information for weather and ocean conditions around the oil and gas production units. WAVCIS has also been an important component of BOEM's Marine Minerals Program providing observational data for wave modeling validations associated with predicting impacts to wave climate associated with excavating offshore sediments. In addition to

hurricanes, more frequent but less severe winter storms can also introduce significant hydrodynamics response and related sediment movement.

The existing system is aging and the three working stations, even though the only such stations in the offshore area of the coastal Louisiana, are constantly experiencing technical problems due to a lack of funding, antiquated electronic and data logging technology, and aging mechanical equipment. The present proposal is aimed at the development of a new system using new technology that will be more economical to operate and at the same time, more reliable, with better sensors and data loggers as well as data transfer technology.

Objectives: The main objective of this CMI is to revive and significantly upgrade the old WAVCIS station CSI 5 which will provide high quality, continuous, and real-time met-ocean data collection and sharing as well as upgrade the system with new technology to allow for measurement of environmental parameters.

Methods: To install the WAVCIS system, conduit cables will be designed, manufactured, and installed with diver operations at the selected location using components recovered from another old station CSI 16. Two SBE-37 SM Conductivity, Temperature, Depth sensors (CTD) will be installed as well as an ultrasonic wind sensor with built-in humidity and temperature will be used for the weather station. A barometric pressure sensor will be included in the met package similar to other WAVCIS stations. Energy requirements will be satisfied by a set of solar panels and lead acid battery banks for continued operation of the sensors and equipment day and night. A WETLabs optical sensor for a visible band scattering will be included in the subsurface. A new data logger CR9000X will be used and programmed to replace the old WAVCIS system. In addition to the real time continuous met-ocean observations, an optical backscatter sensor will be installed, on a seasonal basis, for measurements of environmental parameters. The power system including the solar panel, solar charge controller, battery bank, and boxes will be installed first. The weather station will then be installed. Maintenance will be conducted at 4-6 monthly intervals except for the optical sensor which will only be deployed seasonally (summer and fall) with a one month period for each deployment.

Current Status: Following extensive site negotiations and equipment development then testing, LSU has begun the installation process at the platform. One offshore trip has been conducted to outfit clamps on the rig legs and a return trip is planned for early 2018 to complete the installation of the ocean observing station.

Final Report Due: September 23, 2018

Publications Completed: NA

Affiliated WWW Sites: WAVCIS, <http://wavcis.sci.lsu.edu>

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